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## Museum of Vernacular Architecture of Western Serbia and Eastern Bosnia and Herzegovina: Cattle–Breeding Facilities and Watermills

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### Abstract

The aim of the paper is to present the Museum of Vernacular Architecture of western Serbia and eastern Bosnia and Herzegovina. Documentation was collected by means of fieldwork and in historical archives. Part of the material was published in scientific journals. It is necessary to present the concept of the Museum, and each of the planned units. This paper presents a group with mountain dwellings and watermills. The first part is composed of several buildings that represent different types of structures. The structure, at the same time, shows the development of the building type. The group consists of two huts, two log cabins, the half-timbered building structure, a fenced garden, and a fenced haystack. The group with watermills consists of buildings on the stream, buildings in the middle flow of the rivers, and watermills of the lower flow of the river. Description of the structure, method of construction, and object function is given for each of the buildings.

*Key words:* traditional architecture, Balkan, architectural heritage

### Introduction

The vernacular architecture of Western Serbia and eastern Bosnia and Herzegovina, formed in the 19<sup>th</sup> century, has been vanishing for years. This is confirmed by the research conducted from 1995-2005 and in 2013.

The importance of preserving traditional architecture, for the scientific and laic public is of great importance. It is necessary to take immediate action to preserve and present the remaining examples and building techniques. The Museum of Vernacular Architecture presents traditional forms of construction on the territory of western Serbia and eastern Bosnia and Herzegovina. The aim of this paper is: a) to present the composition of the group of mountain dwellings and group of watermills, and b) to present the structure of the buildings. The paper is based on the documentation collected by the author in two field research campaigns (1995-2005, 2013).

A part of the research was published by the author in domestic and foreign scientific periodicals (Kuzović, 1996; Kuzović, 1996/1997; Kuzović, 2012a; Kuzović, 2012b; Kuzović, 2012c; Kuzović, 2013a; Kuzović, 2013b; Kuzović, 2013c; Kuzović, 2013d; Kuzović, 2014a; Kuzović, 2014b; Kuzović, 2015a; Kuzović, 2015b; Kuzović, 2016; Kuzović and Krsmanović, 2013; Kuzović and Stojnić, 2013; Kuzović and Stojnić, 2015a; Kuzović and Stojnić, 2015b).

Literature that deals with the vernacular architecture of the space covered by the Museum dates back to the 19<sup>th</sup> and 20<sup>th</sup> centuries. During the 19<sup>th</sup> century the most important publications were by the following authors: Ljuba Pavlović (Pavlović, 1925; 1930), Stojan Obradović (Obradović, 1858), Feliks Kanic (Kanic, 1985), Jovan Cvijić (Cvijić, 1931), and Dragiša Pantelić (Pantelić, 1936). The said publications (except books by Jovan Cvijić) do not deal with the vernacular architecture issues.

The research of vernacular architecture in the 20<sup>th</sup> century was conducted and published by: Branislav Kojić (Kojić, 1949, 1941), Aleksandar Deroko (Deroko, 1968, 1964), Jovan Krunić (Krunić, 1983), Ranko Findrik (Findrik, 1995, 1998), Božidar Krstanović (Krstanović, 2000), and Blagota Pešić (Pešić, 1991, 1988). The vernacular architecture of eastern Bosnia and Herzegovina (demographically and culturally similar to western Serbia) has been studied by: Milan Karanović (Karanović, 1927), Muhamed Kadić (Kadić, 1967), Špiro Soldo (Soldo, 1932) and Hamdija Kreševljaković (Kreševljaković, 1957). The aforementioned publications bring general data or analyse individual aspects of traditional architecture).

## Documentation

The Museum of Vernacular Architecture of Western Serbia (Figure 1) and eastern Bosnia and Herzegovina consists of a central complex and four auxiliary units: mountain dwellings, water commercial/traditional crafts facilities, and specific household structures.

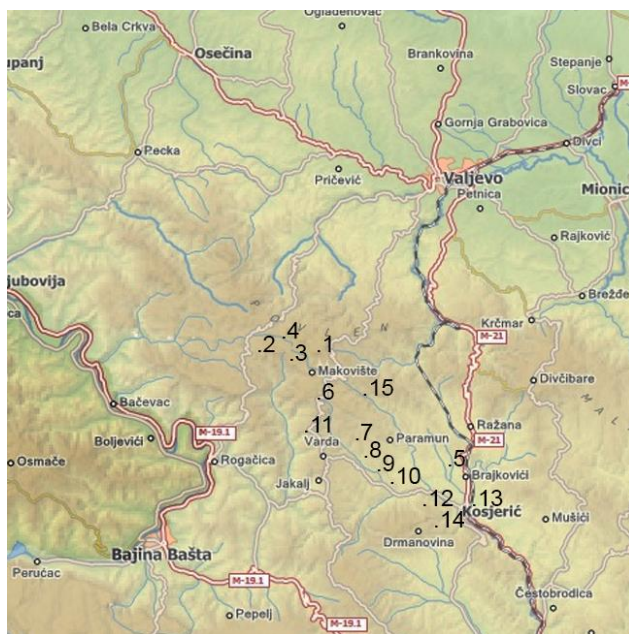


Fig. 1. The original localities of objects proposed as part of the Museum complex  
*Оригинална локација објеката предложених за Музеј*

A section referring to a) mountain dwellings and b) watermills will be analysed in this paper.

## 1. Mountain dwellings

From spring to autumn a part of farming family moves into the mountain together with livestock where they produce cheese and meat. The family lives in simple huts on the mountain. Their courtyard consists of two to three buildings and two enclosed areas (for livestock and garden). The house furniture there is simple (low table and three-legged stools), brought from the central household. Several types of objects are used in the field: a hut („кулача“, „бусара“, „на приковце“), a log cabin, a log and stone cabin, and a movable shelter („кућер“).

A *cottage* is a simple accommodation facility built according the following procedure: along the contour of the base of the building, a low wall of stone without mortar is built on the ground. A belt from wooden beams connected at corners („на ћепм“) is placed on the stone wall. Rafters connected at the top (cutting) are placed on the belt. Branches or carved boards are placed on the roof structure. Fern or grass is used as roof cover.

The roof cover is pressed by wooden branches (so the wind does not blow it up). Wooden branches (protection and for fire), which are constantly renewed are placed vertically around the building. There is only one two-part door on the building (small and large). The small door is closed during the day, the big door is closed at night (Figures 2, 3).



Fig. 2. A hut at the Povlen Mountain  
*"Кулача" на планини Повлен*

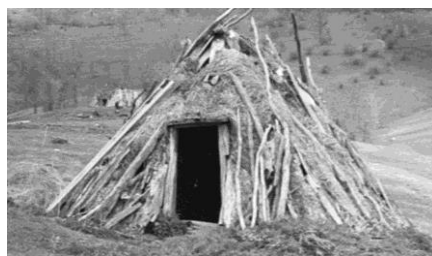


Fig. 3. A hut at the Povlen Mountain  
*"Кулача" на планини Повлен*

The log and stone cabin is partly above, partly buried in the ground. Part in the ground was built of stone (masonry without mortar), a part above the ground made of wood. The structure of the wooden part is a skeleton with a torsion belt. Filling the fields between the skeleton units is made of horizontal thick planks. The roof is hipped, covered by wooden shingles (Figure 4).

The hut ("на приковице") consists of a wooden skeleton and a filling inside. There are horizontally stitched slats (spaced 2-3 cm apart) on both sides of the skeleton. Clay mixed with straw and weeds is inserted between the slats. The wall has no additional surface treatment. There are doors and 1-2 windows on the building. The roof is hipped, covered by wooden shingles (Figure 5).



Fig. 4. The hut covered with shingles  
*"На приковице", покривена шиндром*



Fig. 5. A log and stone cabin  
*Колиба од дрвета и камена*

*The cottage* (log cabin) is constructed in the following way: a wooden belt is laid on the foundations (stone).

Horizontal billets are placed on the belt. The billets are connected at the corners of the shape („*na čert*“). There is only one door on the building. The interior is illuminated by small openings. The roof is hipped, the cover is grass (Figure 6).

*Kučer* is a mobile and small shepherd house, moveable from place to place, accompanying cattle on pasture. A man can sleep, keep bedding, clothes, food and a rifle in it. It is made entirely of wood, with sledges, so that it is easy to roll over the meadows.

There are doors on the narrow part of the building. The structure, the floor base and the (low) side walls are placed on the sledges. The roof is covered by wooden shingles (Figure 7).



Fig. 6. A log cabin covered with grass  
(Brajkovići village)

*Колиба прекривена сијеном*  
(село Брајковићи)



Fig. 7. "Kučer"  
(the Povlen Mountain)  
*Кућер (планина Повлен)*

## 2. Watermills

The group represents economic facilities for grinding grain and softening the canvas. Also, the group includes characteristic types of organization and/or construction of the buildings. In the first phase, the group is to be composed of watermills from the eastern bank of the Drina river. In the second phase the watermills from the west bank of the river will be added.

The watermills will be presented in a group of 6-7 (from the stream), or as independent buildings (from the river). Watermills from the stream were collected in the basins of rivers: Skrapež, Lužnica, Đetinja, Moravica and Drina.



Fig. 8. A watermill on the stream  
(Makovište village)

*Поточна воденица (село Маковиште)*



Fig. 9. A watermill on the stream  
(Makovište village)

*Поточна воденица (село Маковиште)*

The watermills (on the stream) are represented by a group of 6-7 buildings, collected in the villages on the Povlen mountain. The buildings stood alone (the Lužnica, Skrapež, and Rzav rivers) in long strings (the Pološnica river), or in a compact group (the Taor spring) at the original locations.



Fig. 10. A watermill on the stream  
(Ruda Bukva village)

*Поточна воденица (село Руда Буква)*



Fig. 11. A watermill on the stream  
(Pološnica village)

*Поточна воденица (село Полошница)*

This type of watermill is a building with one room. The construction of the watermill is similar to the construction of the buildings on the rural household. The watermill wheel needs to raise the floor far above the ground at a high postament. The structure of the watermill consists of a postament, a corpus and a roof. The watermills are laid on stone foundations, which occupy half of the surface.

The second part of the base, where the watermill mechanism is located, rests on two wooden pillars (buried in the ground). The corpus of the building is made of wooden skeleton. The sprits attached outside of the corpus withstand horizontal forces. The walls are made in horizontal planks. The roof is hipped, the roof cover is wooden shingles or stone slabs. There is only one room inside the building providing space for a grinding mechanism, an area for miller and space for sacks (grain and flour). Underneath the grinding mechanism the floor is wooden (Figures 8-12).



Fig. 12. A watermill on the stream  
(Godečevo village)  
*Поточна воденица (село Годечево)*



Fig. 13. A watermill on the stream  
(Godljevo village)  
*Поточна воденица (село Годљево)*

The water is supplied to the watermill using a pipe made of wood ("badanj"). The grinding mechanism is made of wood, the grinding mechanism stone is made in the villages in the vicinity of Valjevo city. (Figures 14).

*Watermills from the middle flow of the river* is larger in volume and consist of two rooms, namely a room for a grinding mechanism and a miller's living room. The construction is the same as the traditional vernacular house. The foundations of the building are made of stone, and the corpus is made of two parts: log and skeleton. Thick planks are connected at a corner („на ћепм“).

The second part of the corpus was done in skeleton, i.e. the walls are made of vertically laid struts filled with clay mortar (mixed with straw). On the top of the corpus there is a beam laid connecting both parts into one whole. The roof is hipped, the cover is a clay tile (Figure 13).

*Watermills from the lower flow of the river* are the largest economic facility by volume and by number of rooms. This type of watermills has several grinding mechanisms, therefore a larger room is needed. The building has a special storage room for grain and flour, and a living room for the miller.



Several examples, within the entire width of the main facade, have a wooden porch. The corpus was built in two parts: wooden logs and filled skeleton. Wooden logs are connected at the corner („на ћепт“, „на унизу“). The skeleton section has walls filled by adobe, plastered and painted after. Roof construction is hipped, roof cover comprises clay tiles. (Figure 14).



Fig. 14. A watermill, the lower course of the river (Kosjerić village)  
*Воденица на доњем току ријеке (село Косјерић)*

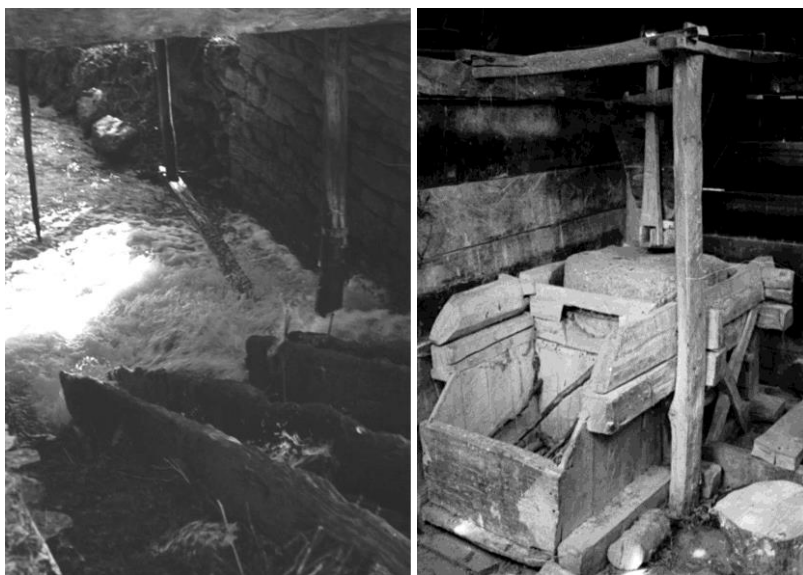


Fig. 15. A watermill's mechanism, lower (Godljevo village), upper (Makovište village)  
*Механизам воденице, доњи дио (село Годљево), горњи дио (село Маковиште)*



## Conclusion

The area of the Drina River basin has preserved homogeneous and attractive traditional architecture. Several groups have been developed for the needs of the Museum on the basis of the material collected in the field. A group of buildings for the needs of the mountain stockbreeder consists of two huts, two cabins, several mobile homes and a skeleton structure. The group with watermills consists of several watermills on the stream, one watermill on the middle flow of the river, and one watermill on the lower stream of the river. The huts and cabins show the way to build the simplest buildings.

Movable objects show the evolution of the structure for characteristic objects in which the cowherd lived. Part of the waterworks planned on the banks of the river contains the necessary number of objects that can be an attractive destination. The watermills represent objects developed according to the needs and capacity of water courses. Also, the constructive solution depends on the required water capacity. A larger array of constructive solutions is shown in watermills in the lower flow of the streams/ rivers. The constructive solution of watermills in this zone is similar to two-part houses. Watermills along the river flows are buildings that can accommodate technological mechanisms with large capacities. In accordance with their size, architectural solutions were developed. Preserving traditional architecture through the Museum is important for educating future architects and engineers, as well as for the cultural awareness and development of the population.

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Origin of figures: Figures 1-15. Author

# Музеј вернакуларне архитектуре западне Србије и источне Босне и Херцеговине, групе: објекти сточара и воденице

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## Сажетак

Предмет рада је Музеј вернакуларне архитектуре. Документација је прикупљена на терену и радом у историјским архивима. Прикупљена грађа је публикована у научним часописима. Потребно је изложити концепцију Музеја, и сваку од планираних целина. У овом раду је приказана група са објектима на планини и воденице. Објекти на планини су састављени од неколико зграда који презентују различите врсте структуре. Структура, уједно, приказује развој ове врсте објеката. Група се састоји од две колибе, две брвнаре, објекта бондручне структуре, ограђеног вртњака, и ограђеног складишта сена. Група са воденицама се састоји од воденица на потоку, воденица из средњег тока река, и воденице доњег тока река. За сваки од објеката је дат опис структуре, начин изградње и функција објекта.

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